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CONTRIBUTIONS TOWARD A KNOWLEDGE OF THE
INSECT FAUNA OF LOWER CALIFORNIA*

No. 5

SYMPHYLA

BY

A. E. MICHELbacher

University of California

NO SERIOUS ATTEMPT to collect symphylans in Lower California has ever been made. During our recent expedition we were so occupied with general collecting that we neglected to make a thorough search for members of this class. Because of the extreme dryness of the peninsula, we found few suitable places for collecting symphylans. Experience has shown that it is scarcely worth while to look for them unless the soil is moist. In two of the localities where moist soil was found, a careful search proved to be difficult because the soil was light and too readily broken up. This same problem would undoubtedly be encountered over a large part of the peninsula.

Attempts were made to collect specimens in only four localities, and they were successful in two places, namely Comondu and Triunfo. At Comondu irrigation produced favorable conditions for collecting, and at Triunfo, in the Cape region, the soil was moist as a result of recent rains. Sufficient evidence was obtained from the examinations made to indicate that Symphyla are probably not rare in Lower California. Although they were not found in abundance anywhere, it seems likely that if more time had been devoted to searching for them, areas would have been found where some species, at least, could have been collected in large numbers.

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Prior to our trip, Hilton (Ann. Ent. Soc. Amer., 24(3) : 537-52) was the only worker who had reported any symphylans from Lower California. His specimens were all from the northern part of the peninsula.

The following is a list of the symphylans known from Lower California.

(1) *Geophilella* sp.

Geophilella RIBAUT, 1913, Bull. Soc. d'Histoire Nat. Toulouse, 46: 77.

A single specimen belonging to this genus was collected on a hillside a mile or two south of Triunfo.

(2) *Symphylella isabellæ* (Grassi)

Scolopendrella isabellæ GRASSI, 1886, Mem. R. Accad. Sci., Torino, (ser. 2) 37: 595¹; HANSEN, 1903, Quart. Jour. Micros. Sci., (n.s.), 47: 74²; HANSEN, 1903, Bull. du Muséum d'Histoire Naturelle Paris, 9: 341³.

Symphylella isabellæ, SILVESTRI, 1902, in: Berlese, Acari, Myriopoda et Scorpiones hucusque in Italia Reperta, Padova, Fasc. 96, No. 10⁴; BAGNALL, 1914, Nat. Hist. Soc. Northumberland Durham and Newcastle-upon-Tyne, Trans. (n.s.) 4: 17, 32 and 40⁵; BAGNALL, 1918, Jour. Zoö. Research, 3: 92⁶; BAGNALL, 1918, Scottish Nat., p. 80⁷; BAGNALL, 1923, The Vasculum, p. 71⁸. HILTON, 1931, Ann. Ent. Soc. Amer., 24(3) : 548⁹.

The writer has never seen any specimens of this species, but Hilton has reported collecting specimens about 50 miles from Tiajuana, below Ensenada on the bay and near Santo Tomas.

Type locality: southern Italy¹. Recorded distribution: southern Italy^{1, 2} Sicily^{1, 2}; British Isles^{5, 6, 7, 8}; Belgium⁸; southern California⁹; Lower California⁹, and France³.

(3) *Symphylella capicola* Michelbacher, new species

(Plate 9, Figures 1a to 1g)

Head slightly elongate, 1.12 times longer than wide; central rod (coronal suture) not interrupted at the middle; the anterior branches (frontal sutures) barely distinguishable; diameter of *post antennal* organs about one-third the greatest width of the third antennal segment. *Antennae* of twenty-one segments. Setae on basal segments prominent and rather long, but much reduced on distal segments. The setae on the inner side of the basal segments much longer than those on the outer side. The beginning of a second whorl of setae commences at the twelfth segment. On the third segment from the apical end two small, circular sensory organs are found which are in line with the whorl of primary setae. Similar organs are found on each of the next three antennal segments. Only the thirteen *tergites* having the triangular processes are considered, and these are referred to by numbers. The tips of the processes are rounded. The distance between the processes of the first tergite at their bases about equal to or a little more than their width at the base. The processes of the second tergite are slightly longer than broad, and the long, anterior lateral setae are only about one-half the length of the processes; those of the

third tergite about six-tenths the length of the processes. The apical setae are located some distance back of the tip of the processes. The number of setae between the anterior lateral and the apical setae shows some variation. The number of setae found on either margin between the anterior lateral and the apical setae for each of the thirteen tergites in the type specimen is shown in table 1. The number of setae found on the only other adult specimen I have is also shown. The number of marginal setae on the two sides of the same tergite of the same individual may show some variation. The first pair of *legs* is reduced to wart-like structures with a prominent spine on their apex. The remaining pairs well developed, and sparsely covered with setae. The tibia of last pair of legs has four rather prominent setae on the upper surface, their length equal to about two-thirds the width of the segment. The tarsus of the last pair of legs three and three-tenths times as long as wide, and on the upper surface there are six prominent setae, four of which are protruding and about as long as the width of the tarsus. On the lower surface of the femur there is a definite bulge. The claws of the last pair of legs unequal; the anterior one being the larger. The *styli* are very much reduced, cone-shaped, densely covered with short hairs except on the apex where there is a spine or a group of hairs that are about one-half as long as the styli. They are found at the bases of the second to the eleventh pairs of fully developed legs inclusive; and are about twice as long as their width at the base. There are seven pairs of fully developed *coxal sacs* which are located at the bases of the second to eighth pair of fully developed legs inclusive. The *cerci* are large and well covered with setae; the setae on the inner surface are curved and nearly of equal length, while those on outer surface are of two types; short curved setae, and very much longer protruding setae. The striped organ about as long as the apical setae and about as long as the longest protruding setae; cerci about three times as long as their greatest width, considerably shorter than the last pair of legs and only about three-fifth as long as the length of the head. Length of holotype 2.6 mm.

Holotype, (No. 4971, Mus. California Acad. Sci., Ent.) from about **three miles south of Triunfo, Lower California**. Two adults and six immature forms were collected July 6, 1938, on a moist hillside.

This species is easily separated from most other members of the genus in that the central head rod is not interrupted at about the middle. *S. antennata* (Han.) also has this character, but is easily distinguished from *S. capicola* by a number of good characters. In *S. capicola* the anterior lateral setae of the second tergite are only about one-half as long as the processes, whereas in *S. antennata* the anterior lateral setae are somewhat longer than the processes. Probably the most important character separating the two species is that in *S. antennata* some of the setae of the antennae are covered with a number of fine hairs, whereas this character is lacking in *S. capicola*. In figuring *S. santa* and *S. vaca* Hilton shows the head rod as not being interrupted. *S. capicola* is separated from *S. santa* by the shape of the tergites and the covering of

setae on the cerci. In *S. capicola* there are curved and much longer protruding setae while in *S. santa* the setae are rather short. *S. capicola* is separated from *S. vaca* by the shape of the tergites and the number of setae found along the lateral margins. Also, in *S. capicola* the cerci are much different than those figured by Hilton for *S. vaca*. It has not been possible for the author to examine any of Hilton's species.

(4) **Symphylella rossi** Michelbacher, new species

(Plate 9, Figures 2a to 2g)

Head somewhat elongate, about one and three-tenths times longer than wide; central rod (coronal suture) barely interrupted at the middle, without median lateral branches; the anterior branches (frontal sutures) present but much less distinct than the central rod. Diameter of postantennal organs slightly more than one-half the greatest width of the third antennal segment. Their openings to the exterior larger than found in most species. *Antennae* of 20 to 24 segments (in the type the left antenna has 20 segments and the right antenna 24 segments). Setae on basal segments very prominent and long, but much reduced on the distal segments. The setae on the inner side of the basal segments nearly two and one-half times as long as those on the outer side. The beginning of a second whorl of setae commences on the tenth to thirteenth segment. On the third segment from the apical end one or two small, circular sensory organs are located along the row of primary setae. Similar organs may be found on the next fourteen segments toward the proximal end. In the type on the right antenna there is one sensory organ on the second antennal segment, two on the third, and one each on the next ten segments. On the left antenna two of these sense organs are found on the third segment from the apical end, three on the fourth, and one each on the next thirteen segments. Only the thirteen *tergites* having the triangular processes are considered, and these are referred to by numbers. The processes are all triangular in shape, and their tips are produced into knobs. The greatest diameter of the knobs about equals the width of their attachment. The distance between the processes of the first tergite at their bases about equals the distance of the width of the processes. The processes of the second tergite are considerably longer than broad, and the apical setae are located some distance back of the tip of the processes. The anterior lateral setae of the second tergite about one-half as long as the processes. Those of the third tergite about two-thirds as long as the processes. The number of setae between the anterior lateral and the apical setae shows considerable variation even in mature specimens. The variation in the type and the range in variation for the species is shown in table 1. The number of marginal setae on the two sides of the same tergite of the same individual may show some variation. The first pair of *legs* are reduced to wart-like structures. The remaining pairs are well developed and are sparsely covered with setae. The tarsus of the last pair of legs about four times as long as wide; the tibia of the last pair of legs is characterized by having four rather

prominent setae on the upper surface, their length equal to slightly more than one-half the depth of the segment. On the upper surface of the tarsus there are six rather prominent setae, four of which are protruding. They are about as long as the width of the tarsus; claws nearly equal although the anterior one may be slightly the larger. *Styli* are very much reduced, cone-shaped, densely covered with short hairs except on the apex there is a spine or a group of hairs that is about two-thirds as long as the styli; the styli are about twice as long as their width at the base. They are found at the bases of the second to the eleventh pair of fully developed legs. There are seven pairs of fully developed coxal sacs which are located at the bases of the second to the eighth pair of fully developed legs inclusive. *Cerci* are large and well covered with setae; the setae on the inner surface are curved and of nearly equal length, while those on the outer surface are of two types: short numerous curved setae, and one to several, usually two, much longer protruding setae; the striped organ only about the length of the terminal setae but hardly as long as the longest protruding setae; the length of the cerci about three times their greatest width. They are much shorter than the length of the last pair of legs and only about six-tenths as long as the length of the head. *Length* of holotype 3.4 mm. Range for species 3.4 to 3.5 mm.

Holotype, (No. 4972, Mus. Calif. Acad. Sci., Ent.) collected at **Comondu, Lower California**. The species was collected in a silty soil in the agricultural land at a point slightly higher than the floor of the valley, where it joins the canyon wall.

The most prominent feature of this species is the long setae found on the inner side of the basal antennal segments. These are two and one-half times longer than those on the outer side. *S. subterranea* is the species that most nearly approaches this, but in this species the setae on the inner side are less than twice the length of those on the outer side. *S. rossi* is also smaller than *S. subterranea*, but averages larger in size than any other member of the genus with the exception of *S. essigi* and *S. oviceps*. The number of setae found between the anterior lateral and the apical setae on the thirteen tergites is close to what is found in *S. essigi*, but only six setae are found on the upper surface of the tarsus of the last pair of legs in *S. rossi* whereas in *S. essigi* the usual number is eight. *S. isabellae* and *S. vulgaris* probably fall in the size range of *S. rossi*, but there are many good characters that separate it from these two species.

(5) *Symphylella* sp.

At the same locality near Triunfo where *Symphylella capicola* was collected, an adult and larva with ten pairs of legs of a species closely related to *S. rossi* were collected. This species so closely resembles *S. rossi* that I hesitate to describe it as new because of the very limited material I have in my possession. Except under unusual circumstances no symphylian should be described without an adequate series.

TABLE 1

NUMBER OF SETAE FOUND BETWEEN THE ANTERIOR LATERAL SETAE AND THE APICAL SETAE ON THE TERGITES WHICH HAVE TRIANGULAR PROCESSES

Tergite number	<i>Symphylella rossi</i> sp. n.		<i>Symphylella capicola</i> sp. n.	
	Number of setae ¹	Range in the number of setae ²	Number of setae ¹	Number of setae in second adult specimen
1	5-5	5-6	4-4	3-3
2	5-5	5-9	5-5	4-5
3	4-6	4-6	3-2	3-4
4	5-5	4-7	2-3	3-2
5	9-9	7-10	5-5	5-5
6	5-5	4-6	3-3	?-2
7	5-5	5-7	3-2	3-3
8	7-7	7-9	5-5	?-5
9	4-5	4-6	3-3	?-3
10	5-5	4-6	2-3	2-2
11	8-7	7-9	4-6	5-5
12	3-4	3-5	3-3	4-4
13	6-6	6-6	5-4	4-3

¹The number of submarginal and marginal setae, between the anterior-lateral setae and the apical setae, and the variation observed on the two sides of the same tergite in the type specimen.

²Range in the number of submarginal and marginal setae between the anterior-lateral setae and the apical setae.

EXPLANATION OF PLATE

PLATE 9

Setae on the head are not shown, and on the tergites only the marginal setae are indicated.

Fig. 1.—*Symphylella capicola* Michelbacher, new species. 1a, tip of antenna; 1b, head; 1c to 1e, first three large tergites; 1f, hind leg; 1g, spinneret. (All $\times 205$.)

Fig. 2.—*Symphylella rossi* Michelbacher, new species. 2a, tip of antenna; 2b, head; 2c to 2e, first three large tergites; 2f, hind leg; 2g, spinneret. (All $\times 155$.)



